

WHAT IS CLAIMED IS:

1                    1.        An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, the nucleic acid encoding a polypeptide comprising greater than 70% amino  
3 acid identity to an amino acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8,  
4 SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16.

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1                    2.        An isolated nucleic acid of claim 1, wherein the nucleic acid  
2 encodes a polypeptide comprising greater than 80% amino acid identity to an amino acid  
3 sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID  
4 NO:12, or SEQ ID NO:16.

1                    3.        An isolated nucleic acid of claim 1, wherein the nucleic acid  
2 encodes a polypeptide comprising greater than 90% amino acid identity to an amino acid  
3 sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID  
4 NO:12, or SEQ ID NO:16.

1                    4.        The isolated nucleic acid of claim 1, wherein the nucleic acid  
2 encodes a polypeptide that specifically binds to polyclonal antibodies generated against  
3 an amino acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10,  
4 SEQ ID NO:12, or SEQ ID NO:16.

1                    5.        The isolated nucleic acid of claim 1, wherein the nucleic acid  
2 encodes a polypeptide that has G-protein coupled receptor activity.

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1                    6.        The isolated nucleic acid of claim 1, wherein the nucleic acid  
2 encodes a polypeptide comprising an amino acid sequence of SEQ ID NO:6, SEQ ID  
3 NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16.

1                    7.        The isolated nucleic acid of claim 1, wherein the nucleic acid  
2 comprises the nucleotide sequence of SEQ ID NO:5, SEQ ID NO:3, SEQ ID NO:7, SEQ  
3 ID NO:9, SEQ ID NO:11, or SEQ ID NO:15.

1                    8.        The isolated nucleic acid of claim 1, wherein the nucleic acid is  
2 amplified by primers that specifically hybridize under stringent hybridization conditions  
3 to a nucleic acid having a nucleotide sequence of SEQ ID NO:5, SEQ ID NO:3, SEQ ID  
4 NO:7, SEQ ID NO:9, SEQ ID NO:11, or SEQ ID NO:15.

1 9. An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, wherein the nucleic acid specifically hybridizes under stringent hybridization  
3 conditions to a nucleic acid having a nucleotide sequence of SEQ ID NO:5, SEQ ID  
4 NO:3, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, or SEQ ID NO:15.

1 10. An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, the polypeptide encoded by the nucleic acid comprising greater than about  
3 70% amino acid identity to a polypeptide having an amino acid sequence of SEQ ID  
4 NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16,  
5 wherein the nucleic acid selectively hybridizes under moderately stringent hybridization  
6 conditions to a nucleotide sequence of SEQ ID NO:5, SEQ ID NO:3, SEQ ID NO:7, SEQ  
7 ID NO:9, SEQ ID NO:11, or SEQ ID NO:15.

1 11. An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, wherein the nucleic acid encodes a polypeptide comprising at least 25  
3 contiguous amino acids of the amino acid sequence of SEQ ID NO:6, SEQ ID NO:4,  
4 SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16.

1 12. The isolated nucleic acid of claim 11, wherein the nucleic acid  
2 encodes a polypeptide that comprises at least 50 contiguous amino acids of the amino  
3 acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID  
4 NO:12, or SEQ ID NO:16.

1 sub B37 13. An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, wherein the nucleic acid encodes a polypeptide comprising greater than 90%  
3 amino acid identity to an amino acid sequence of SEQ ID NO:2 or SEQ ID NO:14.

1 14. The isolated nucleic acid of claim 13, wherein the nucleic acid  
2 encodes a polypeptide that specifically binds to polyclonal antibodies generated against  
3 an amino acid sequence of SEQ ID NO:2 or SEQ ID NO:14.

1 15. The isolated nucleic acid of claim 13, wherein the nucleic acid  
2 encodes a polypeptide that has G-protein coupled receptor activity.

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1 16. The isolated nucleic acid of claim 13, wherein the nucleic acid  
2 encodes a polypeptide comprising an amino acid sequence of SEQ ID NO:2 or SEQ ID  
3 NO:14.

2 17. The isolated nucleic acid of claim 13, wherein the nucleic acid  
comprises the nucleotide sequence of SEQ ID NO:1 or SEQ ID NO:13.

1 18. An isolated nucleic acid encoding a G-protein coupled receptor  
2 polypeptide, the polypeptide encoded by the nucleic acid comprising greater than about  
3 90% amino acid identity to a polypeptide having an amino acid sequence of SEQ ID  
4 NO:2 or SEQ ID NO:14, wherein the nucleic acid selectively hybridizes under  
5 moderately stringent hybridization conditions to a nucleotide sequence of SEQ ID NO:1  
6 or SEQ ID NO:13.

1 19. An isolated G-protein coupled receptor polypeptide, the  
2 polypeptide comprising greater than about 70% amino acid sequence identity to an amino  
3 acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID  
4 NO:12, or SEQ ID NO:16.

1 20. The isolated polypeptide of claim 19, wherein the polypeptide  
2 comprises greater than 80% amino acid sequence identity to an amino acid sequence of  
3 SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID  
4 NO:16.

1 21. The isolated polypeptide of claim 19, wherein the polypeptide  
2 comprises greater than 90% amino acid sequence identity to an amino acid sequence of  
3 SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID  
4 NO:16.

1 22. The isolated polypeptide of claim 19, wherein the polypeptide  
2 specifically binds to polyclonal antibodies generated against SEQ ID NO:6, SEQ ID  
3 NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16.

1 23. The isolated polypeptide of claim 19, wherein the polypeptide has  
2 G-protein coupled receptor activity.

1                    24.    The isolated polypeptide of claim 19, wherein the polypeptide has  
2    the amino acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10,  
3    SEQ ID NO:12, or SEQ ID NO:16.

1                    25.    An isolated G-protein coupled receptor polypeptide, the  
2    polypeptide comprising greater than about 90% amino acid sequence identity to an amino  
3    acid sequence of SEQ ID NO:2 or SEQ ID NO:14.

1                    26.    The isolated polypeptide of claim 25, wherein the polypeptide  
2    specifically binds to polyclonal antibodies generated against SEQ ID NO:2 or SEQ ID  
3    NO:14.

1                    27.    The isolated polypeptide of claim 25, wherein the polypeptide has  
2    G-protein coupled receptor activity.

1                    28.    The isolated polypeptide of claim 25, wherein the polypeptide has  
2    an amino acid sequence of SEQ ID NO:2 or SEQ ID NO:14.

1                    29.    An antibody that selectively binds to the polypeptide of claim 19,  
2    or 25.

1                    30.    An expression vector comprising the nucleic acid of claim 1, 11, or  
2    13.

1                    31.    A host cell transfected with the vector of claim 30.

1                    32.    A method for identifying a compound that modulates signal  
2    transduction, the method comprising:

3                    (i) contacting the compound with a polypeptide comprising greater than  
4    70% amino acid sequence identity to the amino acid sequence of SEQ ID NO:6, SEQ ID  
5    NO:4, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, or SEQ ID NO:16; and  
6                    (ii) determining the functional effect of the compound upon the  
7    polypeptide.

1                    33.    The method of claim 32, wherein the polypeptide has G-protein  
2    coupled receptor activity.

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- 1 34. The method of claim 32, wherein the polypeptide is linked to a  
2 solid phase.
- 1 35. The method of claim 34, wherein the polypeptide is covalently  
2 linked to a solid phase.
- 1 36. The method of claim 32, wherein the functional effect is  
2 determined by measuring changes in intracellular cAMP, IP3, or  $\text{Ca}^{2+}$ .
- 1 37. The method of claim 32, wherein the functional effect is a chemical  
2 effect.
- 1 38. The method of claim 32, wherein the functional effect is a physical  
2 effect.
- 1 39. The method of claim 32, wherein the functional effect is  
2 determined by measuring binding of the compound to the polypeptide.
- 1 40. The method of claim 32, wherein the polypeptide is recombinant.
- 1 41. The method of claim 32, wherein the polypeptide comprises the  
2 amino acid sequence of SEQ ID NO:6, SEQ ID NO:4, SEQ ID NO:8, SEQ ID NO:10,  
3 SEQ ID NO:12, or SEQ ID NO:16.
- 1 42. The method of claim 32, wherein the polypeptide is expressed in a  
2 cell or cell membrane.
- 1 43. The method of claim 42, wherein the cell is a eukaryotic cell.
- 1 44. The method of claim 43, wherein the cell is an adipocyte.
- 1 45. The method of claim 43, wherein the cell is a spleen cell.
- 1 46. The method of claim 43, wherein the cell is a colon cell.
- 1 47. The method of claim 43, wherein the cell is a neuron.
- 1 48. A method for identifying a compound that modulates signal  
2 transduction, the method comprising the steps of:

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3 (i) contacting the compound with a polypeptide comprising greater than  
4 90% amino acid sequence identity to the amino acid sequence of SEQ ID NO:2 or SEQ  
5 ID NO:14; and

6 (ii) determining the functional effect of the compound upon the  
7 polypeptide.

1 49. The method of claim 48, wherein the polypeptide has G-protein  
2 coupled receptor activity.

1 50. The method of claim 48, wherein the polypeptide is linked to a  
2 solid phase.

1 51. The method of claim 48, wherein the functional effect is  
2 determined by measuring changes in intracellular cAMP, IP3, or  $Ca^{2+}$ .

1 52. The method of claim 48, wherein the functional effect is a chemical  
2 effect.

1 53. The method of claim 48, wherein the functional effect is a physical  
2 effect.

1 54. The method of claim 48, wherein the functional effect is  
2 determined by measuring binding of the compound to the polypeptide.

1 55. The method of claim 48, wherein the polypeptide is recombinant.

1 56. The method of claim 48, wherein the polypeptide comprises the  
2 amino acid sequence of SEQ ID NO:2 or SEQ ID NO:14.

1 57. The method of claim 48, wherein the polypeptide is expressed in a  
2 cell or cell membrane.

1 58. The method of claim 57, wherein the cell is a eukaryotic cell.

1 59. The method of claim 58, wherein the cell is a kidney cell.

1 60. A method of treating kidney disease, the method comprising the  
2 step of administering to a patient a therapeutically effective amount of a compound  
3 identified using the method of claim 48.

1                   61.     A method of treating cerebral cavernous malformations, the  
2 method comprising the step of administering to a patient a therapeutically effective  
3 amount of a compound identified using the method of claim 48.

1                   62.     A method of treating hyperlipidemia, the method comprising the  
2 step of administering to a patient a therapeutically effective amount of a compound  
3 identified using the method of claim 32.

1                   63.     A method of treating obesity, the method comprising the step of  
2 administering to a patient a therapeutically effective amount of a compound identified  
3 using the method of claim 32.

1                   64.     A method of treating dyslexia, the method comprising the step of  
2 administering to a patient a therapeutically effective amount of a compound identified  
3 using the method of claim 32.

1                   65.     A method of treating cardiac myxoma, the method comprising the  
2 step of administering to a patient a therapeutically effective amount of a compound  
3 identified using the method of claim 32.

1                   66.     A method of detecting the presence of an TGR-GPCR or a EDG-  
2 GPCR nucleic acid or polypeptide in human tissue, the method comprising the steps of:  
3                   (i) isolating a biological sample;  
4                   (ii) contacting the biological sample with a TGR-GPCR-specific  
5 reagent or a EDG-GPCR-specific reagent that selectively associates with an TRG-GPCR  
6 nucleic acid or polypeptide or a EDG-GPCR nucleic acid or polypeptide; and,  
7                   (iii) detecting the level of TGR-GPCR-specific reagent or EDG-  
8 GPCR-specific reagent that selectively associates with the sample.

1                   67.     The method of claim 66, wherein the TGR-GPCR-specific reagent  
2 or EDG-GPCR-specific reagent is selected from the group consisting of: antibodies,  
3 oligonucleotide primers, and nucleic acid probes.